

ANNUAL IMPLEMENTATION REPORT

Voluntary contributions from the Russian Federation

GENERAL INFORMATION	
Project number and title of the project	E361-Improving capacities of the UNECE member States to decarbonize the transport sector by increasing the use of natural gas as a motor fuel
Project manager	Branko Milicevic
Project duration as approved	June 2020 - June 2022
Actual project duration	June 2020 – June 2022
Reporting period	January - December 2021
Financial implementation rate (in % of total project budget)	70 % (estimate)
Summary of impact/outcomes	<p>The project produced a comprehensive report of the natural gas vehicles (NGV) including (i) assessment of the state of development of CNG and LNG refueling and storage infrastructure in the project countries; (ii) case studies with effective regulatory, legal, economic, technical, and public perception promotional activities to increasing the share on CNG/LNG vehicles in the light- and heavy-duty road fleets; (iii) life cycle analysis of competing fueling options (diesel, natural gas, electricity, hydrogen) in the project countries evaluating total energy use, fuel economy, energy efficiency and greenhouse gas emissions; (iv) comparative analysis of safety requirements for refueling stations as one of the most serious barriers to market development; (v) public opinion research on introducing natural gas as a motor fuel; (vi) case studies on popularization of using natural gas for vehicles, such as advertising, video, films; (vii) case studies on CNG/LNG refueling infrastructure and/or removing other barriers to the use of CNG/LNG in transportation. As a result of this analysis, the recommendations on removing regulatory, legal, economic, technical and public perception measures aimed at promoting the use of gas in transportation and removing relevant barriers have been developed. Findings of the study and its recommendations were presented at the workshops “Decarbonizing Transport with Natural Gas” on 8 October 2021 in St. Petersburg, and “Support to Decarbonization of Transport in Kazakhstan” on 24-25 November 2021 in Almaty. By implementing these activities, the project improved understanding of stakeholders in the project countries on benefits of natural gas in transportation as a viable and low-carbon option and enhanced capacities on development of infrastructure for affordable, sustainable and clean natural gas.</p>
SDGs and targets project contributed	SDG 7 7.a By 2030, enhance international cooperation to facilitate access to clean energy research and technology, including renewable energy, energy efficiency and advanced and cleaner fossil-fuel technology, and promote investment in energy infrastructure and clean energy technology SDG 13

	13.2 Integrate climate change measures into national policies, strategies and planning
REVIEW OF EXPECTED ACCOMPLISHMENTS AND ACTIVITIES AS PER PROJECT DOCUMENT <i>(Please make sure the review (i) includes all EAs and activities as per the project document implemented during the review period, (ii) provide information on the venue of workshops/seminars, their dates and the number of participants, including gender-disaggregated, and (iii) state if the activities have been completed or are still incomplete)</i>	
Expected Accomplishment 1 (EA1)	EA1. Improved understanding of the UNECE member States on the benefits of natural gas in transportation as a viable low-carbon alternative to incumbent fuels (petrol and diesel) and emerging technologies (electricity, hydrogen)
Indicators of Achievements for EA1	IA1.1. At least 80 participants from (eight) selected countries improved their understanding of the benefits of natural gas in transportation (evidenced by the event evaluation of participants) Achieved. 166 participants from Belarus, Kazakhstan, Kyrgyzstan, Moldova, Tajikistan, Uzbekistan and the Russian Federation improved their understanding of the benefits of natural gas in transportation.
Main Activity A.1.1 <i>(Title of Main Activity A1.1, as per the project document)</i>	A.1.1. Assessing the state of development of CNG and LNG refueling and storage infrastructure in target UNECE countries The activity is completed. The Stage of Development of NGV Markets in UNECE Countries, including CNG and LNG refueling and storage infrastructure, was conducted. Target countries differs substantially in terms of economic development, transport market shape, energy and transport policy. Their backgrounds in natural gas deployment in energy and fuel sector considerably differ too. NGV markets in the project countries can be divided into 3 groups: (i) initial stage of the NGV market development (Azerbaijan, Bosnia and Herzegovina, Kyrgyzstan, North Macedonia, Romania, Turkmenistan); (ii) emerging NGV markets (Belarus, Bulgaria, Kazakhstan, Moldova, Serbia, Tajikistan); (iii) mature NGV markets (Armenia and Uzbekistan). By initial stage of development, it is understood that the number of CNG stations is less than 10 and the dynamics of NGV fleet is quite low. Further analysis of these countries primarily focuses on key barriers to market development. Emerging market implies a greater number of stations, from 10 to 100. The conditions for successful NGV market development at this stage are quite promising. Mature NGV market is characterized by a high level of saturation with filling stations and low potential for further growth. Guidelines for mature markets mostly focus on the question of safety and CNG cylinders circulation control. This assessment is part of report available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf The findings of the assessment were discussed at the Workshop on Decarbonizing Transport with Natural Gas in St. Petersburg and online, on 8 October 2021. The event was attended by 70 participants. Workshop webpage: https://unece.org/sustainable-energy/events/workshop-decarbonizing-transport-natural-gas-hybrid-st-petersburg-and
Main Activity A.1.2	A.1.2. Identifying and developing case studies with effective regulatory, legal, economic, technical, and public perception promotional activities as well as barriers to increasing the share on CNG/LNG vehicles in the light- and heavy-duty road fleets.

<p><i>(Title of Main Activity A1.2, as per the project document)</i></p>	<p>The activity is completed. Case studies with effective regulatory, legal, economic, technical, and public perception promotional activities as well as barriers to increasing the share on CNG/LNG vehicles in the light- and heavy-duty road fleets have been developed and analysed. NGV case study analysis includes examples of Sakhalin region (Russian Federation), Belgorod region (Russian Federation), Republic of Tatarstan (Russian Federation), Bogota (Colombia), and Bengaluru (India). This analysis is part of report available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p> <p>The examples of case studies were presented and discussed at the Workshop on Decarbonizing Transport with Natural Gas in St. Petersburg and online, on 8 October 2021. The event was attended by 70 participants. Workshop webpage: https://unece.org/sustainable-energy/events/workshop-decarbonizing-transport-natural-gas-hybrid-st-petersburg-and</p> <p>Some case studies were also presented and discussed at the Workshop “Support to Decarbonization of Transport in Kazakhstan” on 24-25 November 2021. The workshop was attended by 96 participants. Workshop webpage: https://unece.org/sustainable-energy/events/workshop-support-decarbonization-transport-kazakhstan</p>
<p>Main Activity A.1.3 <i>(Title of Main Activity A1.3, as per the project document)</i></p>	<p>A1.3. Conducting a life cycle analysis of competing fueling options (diesel, natural gas, electricity, hydrogen) in target UNECE countries evaluating total energy use, fuel economy, energy efficiency and greenhouse gas emissions;</p> <p>The activity is completed. The life cycle analysis of competing fueling options in the UNECE project countries was conducted. The life cycle analysis revealed that emissions for natural gas vehicles manufacturing are the same as for petrol. Cars, at the same time manufacturing of battery electric vehicle (BEV) results in double emissions. More than 40% of emissions from BEV manufacturing comes from the battery. The manufacturer uses a lot of power for battery production. Natural gas (CNG/LNG) is preferable compared to diesel and gasoline. Addition of bio fuel can reduce emissions for all fuels accordingly. Additionally, CO2 is not the only compound to be considered when assessing the environmental impact of transport. Natural gas technologies, as opposed to oil-based fuels that enhance the pollution load, offer an immediate solution through the reduction of pollutants concentration in the air, including particulate matter, nitrogen oxide (NOX), sulfur dioxide and ozone, providing for unpolluted air together with further climate benefits.</p> <p>This analysis is available as part of a comprehensive NGV report at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p> <p>The life cycle analysis was presented and discussed at the Eighth session of the Group of Experts on Gas on 25-26 March 2021: https://unece.org/info/Sustainable-Energy/Natural-Gas/events/351570</p>
<p>Main Activity A.1.4 <i>(Title of Main Activity A1.4, as per the project document)</i></p>	<p>A.1.4. Conducting comparative analysis of safety requirements for refueling stations as one of the most serious barriers to market development.</p> <p>The activity is completed. Comparative analysis of safety requirements for refueling stations was conducted. This comparative analysis concluded that technical regulations set the requirements for the following aspects: (i) fire safety requirements: fire resistance, alarm systems, lightning protection and grounding, requirements for the placement and territory, fire risk coefficient that determines the distance to objects ; (ii) industrial safety requirements: safety requirements for design and equipment; operational safety requirements; safety requirements for tank, group cylinder installations, etc. International standards (ISO) cover the following aspects: fire protection,</p>

	<p>explosion protection measures, site layout, environmental requirements, operational safety requirements and requirements to equipment, control system and emergency shutdown. The most significant for investors is the requirement for minimum distances from refueling facilities to other facilities. These requirements determine the size of land plot and the cost of construction. The analysis is included as part of NGV report, available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p>
<p>Main Activity A.1.5 <i>(Title of Main Activity A1.5, as per the project document)</i></p>	<p>A.1.5. Conducting public opinion research on introducing natural gas as a motor fuel</p> <p>The activity is completed. The public opinion research was conducted. Data was collected about individual perception of the NGV market and government vision of the market development specificity. Three surveys were available for different market participants (car owners, transport and energy sector experts and representatives, government authorities and public organizations). The results of surveys revealed that common reasons behind the respondents' answers is lack of NGV promotion and unclear public information about the advantages of natural gas as motor fuel. The results of survey are presented in the report available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p>
<p>Main Activity A.1.6 <i>(Title of Main Activity A1.6, as per the project document)</i></p>	<p>A.1.6. Developing collection of case studies (and translating them into Russian) on popularization of using natural gas for vehicles, such as advertising, video, films, etc.</p> <p>The activity is completed. Case studies on popularization of using natural gas for vehicles include videos and advertising supporting CNG and LNG deployment from China, India, Germany, Russia, South Korea. Some case studies are available in English, the others are in Russian.</p> <p>A collection of case studies is presented in the report available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p> <p>Promo videos supporting CNG and LNG deployment are also available at: https://unece.org/sites/default/files/2021-04/NGV_Report_ExecSummary_2004.pdf</p>
<p>Expected Accomplishment 2 (EA2)</p>	<p>EA2. Improved national capacities for developing gas infrastructure in the context of sustainable energy (accessible, affordable, clean)</p>
<p>Indicators of Achievements for EA2</p>	<p>IA2.1. At least 40 experts improved their skills in managing gas infrastructure projects</p> <p>Achieved. More than 70 experts improved skills on gas infrastructure projects</p> <p>IA2.2. At least 4 countries submitted national case studies on removing barriers to the use of gas in transport (evidenced by the impact discovery).</p> <p>Achieved. Case studies from 5 countries on removing barriers to the use of gas in transport were identified.</p>
<p>Main Activity A.2.1 <i>(Title of Main Activity A2.1, as per the project document)</i></p>	<p>A.2.1. Developing recommendations/policy guidelines on removing regulatory, legal, economic, technical and public perception measures aimed at promoting the use of gas in transportation and removing relevant barriers.</p> <p>The activity is completed. Recommendations and guidelines were developed based on overview of the NGV markets in the project countries, as well as the analysis of the best practices of regional state regulation.</p> <p>They include the following: (i) the rational choice of the transport transition direction connected to the energy transition. BEV can be an option for decarbonization if coal does not prevail in the power mix of a country. That is why conducting a special research of power mix for every project country is recommended. (ii) Each country should have a comprehensive development</p>

	<p>program for the NGV market, including different segments of the transport sector: private cars, buses, heavy trucks, construction and communal machinery, agricultural and quarry machinery, railway transport, water transport etc. A comprehensive development program should include a layout for gas station infrastructure (CNG and LNG) with pipeline connection and supporting infrastructure (cylinder inspection centers, service centers, retrofitting points etc). The layout should be based on the potential demand research for different segments of the transport sector. In areas with low natural gas network coverage it is advisable to consider the possibility of creating an infrastructure for small-scale LNG and start the transition from commercial segments of transport sector, primarily long-distance heavy trucks and machinery. (iii) Technical regulation requires harmonization between different countries. As project countries connected with highways and possible CNG and LNG ‘corridors’, the creation of a unified interstate register of cylinders to control their circulation and simplify procedures for the end user when crossing borders is recommended.</p> <p>These recommendations are available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p>
<p>Main Activity A.2.2 <i>(Title of Main Activity A2.2, as per the project document)</i></p>	<p>A.2.2. Developing up to 4 (four) national case studies on CNG/LNG refueling infrastructure and/or removing other barriers to the use of CNG/LNG in transportation.</p> <p>The activity is completed. The case studies from the Russian Federation, Germany, China, and India were identified. They are included into the NGV report available at: https://unece.org/sites/default/files/2021-04/NGV_report.pdf</p> <p>The examples of case studies were presented and discussed at the Workshop on Decarbonizing Transport with Natural Gas in St. Petersburg and online, on 8 October 2021. The event was attended by 70 participants. Workshop webpage: https://unece.org/sustainable-energy/events/workshop-decarbonizing-transport-natural-gas-hybrid-st-petersburg-and</p> <p>The additional case studies are planned to be also discussed at the project workshop to be conducted in May 2022.</p>
<p>Expected Accomplishment 3 (EA3)</p>	<p>EA3. Improved awareness of the role of CNG and LNG in transportation in selected countries and worldwide.</p>
<p>Indicators of Achievements for EA3</p>	<p>EA3.1. At least 100 participants from (eight) selected countries confirmed improved understanding key global trends and developments, and opportunities to expand s of the role of CNG and LNG in transportation. Partially achieved. 160 participants from project countries improved understanding of key global trends and developments of the use of CNG/LNG in transportation. More events (project workshop and other meetings) are planned for 2022. In progress.</p>
<p>Main Activity A.3.1 <i>(Title of Main Activity A3.1, as per the project document)</i></p>	<p>A.3.1. Organizing 2 (two) capacity-building workshops to disseminate key recommendations and support peer-to-peer learning and adoption of good practices</p> <p>The activity is partially completed. Workshop on Decarbonizing Transport with Natural Gas was conducted in hybrid format (online and in St. Petersburg) on 8 October 2021. The event was attended by 70 participants. Workshop webpage: https://unece.org/sustainable-energy/events/workshop-decarbonizing-transport-natural-gas-hybrid-st-petersburg-and</p> <p>Another capacity-building workshop to disseminate key recommendations and support the adoption of good practices will be conducted in May 2022.</p>

<p>Main Activity A.3.2 (Title of Main Activity A3.2, as per the project document)</p>	<p>A.3.2. Participating in two other meetings to present and promote the results of the project and raise awareness of the benefits of natural gas in transportation.</p> <p>The activity is partially completed. The findings of project report were presented and awareness of the benefits on use of natural gas in transport was raised at the Workshop “Support to Decarbonization of Transport in Kazakhstan” on 24-25 November 2021. The workshop was attended by 96 participants.</p> <p>The findings and recommendations of project report will also be presented and disseminated during meetings previewed in the period of February-May 2022.</p>
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<p>Comments/ additional information</p> <p>Please use this section to provide the donor with information on your plans to ensure full project implementation by the completion date</p> <p>The remaining project activities for 2022 include (i) organization of a capacity-building workshop to disseminate key recommendations and support the adoption of good practices on the use of natural gas in transport (planned for May 2022); (ii) participation in the meeting(s) to present key project findings and recommendations at other meetings (planned for February-May 2022)</p>
